Mark's notes from mini-CSEWG

Next CSWEG meeting 6-9 November 2017. NDAC is 2-3 November.

CSEWG started in 1966 - sort of 50 years ago.

Standards.

Now Cnat standard is consistent with the VIII.0 12,13C files.

Au(n,g) at 30 keV is now a standard.

235U(n,f) at 7.8-11 eV is now a standard.

Below 1 MeV the 235U and 239Pu fission is about 0.4 percent higher, influenced especially by the thermal constant change.

Other notable changes: boron is outside 1-sigma. 6Li(n,t) in the MeV region is a few percent higher owing to the LANCE Devlin data. Natural carbon increases 1-2 percent in the MeV region too.

Roberto notes that the only major discrepancy between our beta4 values and the thermal constants is 239Pu - owing to the goal to match solution criticality.

Hydrogen small changes (including thermal capture) had some impacts on our criticality.

Dosimeter (n,2n) Lr-0(n,2n) reactions in a thermal 235U tail from a reactor:

89Y(n,2n) 0.5 percent (-9.1 percent previous, 0.5 percent now) in 235U thermal spectrum.
* check how the dosimeter yttrium file compares with VII.1=VIII.0.

Apparently Ron Nelson's gamma production values may change - but this is too late to impact the VIII.0 standards.

Kahler, validation testing

Fast looked great
HST look great
PST look great (but with knobbing)
LCT suite perhaps a bit low - drop of say 27 pcm so now approx. 75 pcm low. (ORNL not happy!)

Fast iron look good. And a bit hotter.

Hmf7. Perhaps a bit better now, for these polyethylene reflected cases. Capote thought nubar fluctuations in the 1-5 keV could have some more work but few measurements exist.

PMF generally have a big scatter and have not improved in going to VIII.0

(n,2n) testing

Pu239(n,2n). Looks like they changed (increases) by 7-9.5 percent; a bit more than we wanted.
MC - maybe reduce (n,2n) threshold change by about half.

U233 comp therm (naval expts) worse.

Livermore Pulsed spheres - Denise with inputs from Frankle.

235U, 239Pu look fine. 238U not as good (but beta4 not obviously worse). Capote thinks the experiment normalization might be wrong. Brian K did a normalization change we need to understand why?

IAEA Trkov testing

The 119 Mosteller suite has a chi2 much improved.

Morgan - raised graphite fast performance concerns. He will provide a summary of his concerns including changes in C/E.

Fast assemblies plotted versus EALF. Look much better now, e.g., for Jemimas.
LCT42 a bit worse (maybe iron) but big uncertainty in benchmarks.
Comet a bit high. Perhaps related to hmf7 overcalculation.

Pulsed sphere - he shows 235U very good. 238U looks good so we need to clarify differences between Brian and Denise.

Mike Zerkle and Jason Thompson (and Tim Trumble), Naval Nuclear Laboratory

Trisha benchmark calculates higher now in poorer agreement owing to fission changes.

Some proprietary benchmarks they can't discuss.

Iron transmissions look pretty good, though perhaps 100-200 keV a bit worse but within the experimental uncertainty. IPPE trans01 experiment.
Their FCA model has big differences - let's try to understand since has thought we were doing better. Eg IX-1.
Zrkle

Testing H in H_20 at elevated temperatures

Model from CAB was compared with previous data. The rotational moment was raised significantly, with some other changes (hindered rotation mode).
Androtti at Rome has done experiments at SNS and ISIS and said their are some shifts as in the beta4 model but the data are not published yet.

The high temperature changes are notable for light water reactors. Seems to be mostly the rotational model, related to the phonon spectrum, leading to 6-8% cross section changes.

Integral experiments from a NNL-Rolls Royce collaboration. Now they see a calculated temp trend using the CAB data.
This needs to be taken up with the CAB group and with WPEC SG42.
Zrkle will also try running beta4 using 7.1 ENDF s,alpha,betas to be sure the changes are from the s,alpha,betas.

Would like max temp increased from 623 to 800K for safety applications.

He also noted some changes he'd like to see role back related to double precision.

Dave’s mini-CSEWG To Do Items

MF4: Mike's wording about no two-body, need P(E|E')

ENDF project Governors Board rep: Mike Dunn, Jeremy Conlin

Gcc >> 5.1 on ADVANCE1

IAEA project Governors Board rep: Andrej Trkov, probably Arjan Koning (they'll get back to us)

PGFS(nug) iteration, rapidly, Ionel is POC

TKE iteration, rapidly, Morgan is POC

Iterate with Gerry on p+d, d+t (check deficiencies)

Schedule Hackathon (want Caleb, TK, Doro, Ian, whoever else we can get)

Add in check vs. AME mass tables into ADVANCE or hooks

Circulate decay data errors/warnings to Alejandro, Tim & Libby

244Am -> J4!
242Am -> J4 102!

Check for missing capture gammas (Ian has list)

Close trackers in manual area

Mid-August beta, so can tag release, test covariances
if needed sneak in late September

Format & file go rounds between May & June/July

CSEWG mailing list/spammer fix

53Cr, Marco & Andrej to iterate to a decision point by June

Tolerance on positive definite covariance matrices

End of July stare a covariances skype-athon

Did we lose ORNL MT32's for Ni?

58Ni ORNL RRR, MT32
59Ni J4 RRR, no MT32
60Ni ORNL RRR, MT32
61Ni J4 RRR, no MT32
62Ni ORNL RRR, no MT32
63Ni J4 RRR, no MT32

JENDL4, JEFF, TENDL, use TENDL steal list + Pt, Po, also holes

Things that have to get fixed/checked before release:

- Fiss energy added
- PFGS fixed for U5,8 and pu9
- Water scattering kernel issue
- Cr53 decision (perhaps just live with what is in 8b4)
- U33 study (but perhaps live with 8b4)
- 238U PFNS (maybe just put in JENDL for 16 and above, to reserve testing we have done at 14-15)
- Check carbon gamma -prod (I just sent out an email on this; maybe we are OK).
- Carbon12 - add in 20-150 section
- Drop natC
- 16O capture gammas - check

- Make MCNP test problems to scan through g (and other ... n) production from 8b4 versus 7.1 to check for anomalies/surprise
- Fe high energy data fixes and validation
- Ask Yaron to run 8b4 be9 in his scattering simulation test case
- Ask TK if 14 MeV Cu(n,xn) needs upgrading based on VDM simulation test case
- Resolve scale discussion on 238U Livermore pulsed sphere analysis (Brian K and Roberto talk with Denise and Stephanie)
- Covariances